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OF THE

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THE AGRICULTURAL PESTS ENACTMENT NO. 13 OF 1913.

(*Continued*).

By F. W. South.

In an article in the previous number of the *Agricultural Bulletin* the first four sections of this Enactment were dealt with. It is the purpose of this article to consider the remaining sections.

PROCEDURE FOR THE CONTROL OF INTERNAL PESTS.

A. The Routine of the Inspecting Officers, §§ 5-9.

The provisions for dealing with the control of pests already known or that may arise in this country—one of the two main objects of this act—are contained in Sections 5-12 inclusive. In actual practice the Inspector will visit estates or small holdings and will examine them thoroughly to determine what pests or diseases are present and if those that may occur are receiving adequate treatment, he will also take into consideration whether or not the land visited is in a sanitary condition. Due notice of a proposed visit will be sent to all managers of estates. If as a result of such an inspection any pest or disease is found which is unknown to the Inspector, he will remove such specimens of it, as he may require and will forward them to the Government Entomologist or Mycologist for further investigation. Power to take this action is conferred by Section 5 on each inspector within the area for which he is appointed. If an estate is found on inspection to be free from any pest or disease, or if it is found that any pests or diseases present are being adequately dealt with a short notice to that effect will be sent to the manager signed by the Inspecting officer.

If, however, certain pests or diseases are found on any cultivated plant, which are not under control, or if the land or the plants on it are in an insanitary condition, the Inspector will send to the

owner or occupier of the land a signed notice requiring him to take such measures as are stated in the notice before a stated date. This is in accordance with Section 6. When the time allowed has expired the Inspector will revisit the land and if action has not been taken in accordance with the notice, he will report the matter to the Director of Agriculture. On receipt of a favourable reply the Inspector will send a second notice to the owner or occupier stating that as he has failed to comply with the terms of the first notice, he (the Inspector) will enter on the land with such men as may be necessary and will cause his instructions to be carried out by them, after which he will with the authorization of the Director of Agriculture recover the cost of the work by civil suit. The necessary authorization from the Director of Agriculture will have been given in the reply to the original report. After serving this notice, the Inspector will proceed in accordance with it by virtue of the powers conferred on him by Section 8. Any owner or occupier who shall have failed to comply with the terms of the original notice served on him under Section 6 will under Section 9 render himself liable also to criminal proceedings for which the maximum penalty is $500.

In order to control the powers of the Inspectors, any owner or occupier on whom a notice has been served under section 6 has the right under Section 7 to appeal to the Supervising Committee of which the constitution was described in the previous article under Section IV. This committee may suspend the operation of the original notice or make such other order as in the circumstances they may think just. Such appeal must be sent to the office of the Director of Agriculture within 7 days from the service of the original notice.

B. Special Quarantine, § § 10 and 11.

In special cases where it is considered necessary the Director of Agriculture may with the approval of the Resident of the State make an order placing in quarantine any land on which there are diseased plants, and the land will continue in quarantine until the Director shall certify that no plants on it are diseased. While any land is in quarantine no plants may be removed from it except with the permission and in accordance with the directions of an Inspecting Officer. This provision would be useful in the case of a serious local outbreak of any disease previously unknown or considered to be of but little importance. In accordance with Section 11 the owner or occupier of any land in quarantine may apply to an Inspecting Officer to examine the land with a view to obtaining a certificate of freedom from disease from the Director of Agri-

culture under Section 10. The cost of any such examination except the first must be borne by the applicant.

C. Special Destruction, § 12.

If in the opinion of the Director of Agriculture the destruction of any diseased plant is a matter of necessity or extreme urgency, he may make an order in writing directing the destruction of the plant by any person mentioned in the order, and the cost of such destruction must be defrayed by the owner or occupier of the land on which the plant is found. This provision would be of particular value in the event of the sudden appearance of one or more cases of a pest or disease known or judged liable to be capable of rapid spread and of causing serious damage.

Locusts, § 13 and 14.

The special regulations in connexion with the appearance of these insects on any land may be ascertained by reference to the Enactment itself. Special attention may however be called to Section 13, subsection (i) (*a*) which requires that any owner or occupier of land on which these insects appear shall immediately give notice of their appearance to an Inspecting Officer or at the nearest Land Office or Police Station. Ready compliance with this provision on the part of several members of the public has already been of considerable assistance to the Department of Agriculture.

Special Legislation Relating to Coconut Trees, § § 15-19.

These sections embody the main provisions of the Coconut Trees Preservation Enactments of 1898 which were repealed by the Enactment under consideration. It should be noticed that the execution of the provisions under these sections is in the hands of all District officers and all officers appointed as Collectors or Assistant Collectors under the "Land Enactment, 1911." Consequently the Inspecting Officers have ex officio no powers or duties under these sections; but if he think fit the Resident of any State may appoint those in his State to exercise powers and perform duties under these sections by notification in the Gazette. It may also be pointed out that when proceedings in Court are instituted by a duly authorised Officer under Sections 15 and 18 in connexion with the protection of coconut trees the written authority of the Director of Agriculture is not necessary, though in accordance with Section 25 it is necessary in all other legal proceedings under this Enactment.

Inspecting Officers can, however, deal with the pests and diseases of coconut trees and with the insanitary condition of any land upon which coconut trees are grown under the general Sections 5, 6, 8 and 9 of this Enactment. For the sake of uniformity of procedure all action relating to coconuts that has to be undertaken by an Inspecting Officer other than a District Officer or a Collector or Assistant Collector will be conducted in accordance with the general sections enumerated above. But, in special cases where it may be deemed advisable the Resident of a State will be asked to confer powers on an Inspecting Officer under Sections 15, 16, 18 and 19 by notification in the Gazette.

COMPENSATION, §§ 17 AND 20.

No owner or occupier of land is entitled to compensation for any expense incurred or damage occasioned by an order given or act done in pursuance of the provisions of this Enactment unless the damage is inflicted maliciously and without reasonable cause. "But the Chief Secretary may, in his discretion, order that such compensation as he may think fit be paid to the owner or occupier of any land who is required to destroy as a measure of precaution any plant thereon not being diseased." In no case, however, will compensation be paid in excess of the value of the plant destroyed. There is one exception to this provided for by Section 17 which authorises the Resident of any State to make any compensation he may think fit not exceeding five dollars for each tree to any owner of a coconut tree who is in needy circumstances and is required to destroy such tree. The total compensation given to any one person in one year under this section shall not exceed $100.

THE INTRODUCTION OF PESTS OR DISEASES FROM ABROAD, § 21 (i).

The Chief Secretary may from time to time make rules for preventing the introduction of pests into the Federated Malay States. "Such rules may provide, amongst other things, for

(*a*) Prohibiting the landing in the Federated Malay States from places outside the said States of any plant or animal, the landing of which may appear to the Chief Secretary to be likely to introduce any pest;

(*b*) The treatment or destruction of any plant or animal which has been landed and of the packages, cases, pots or coverings in which the same may be packed."

RULES, § 21 (ii).

The Chief Secretary may also from time to time make rules for fully and effectively carrying out and giving effect to the various provisions and powers contained in this Enactment.

Special attention may be called to the rule requiring the notification by owners and occupiers of land of the following pest and diseases namely: *Brachartona catoxantha,* a caterpillar pest of Coconuts, and Pink disease of rubber caused by *Corticium salmonicolor* = *Corticium javanicum* = *Corticium Zimmermanni.* The presence of these must be notified to the Chief Agricultural Inspector or the Assistant Agricultural Inspector in the State or that part of it in which the pest or disease is found. The notification of the former must be made within fourteen days and of the latter within one month of first finding the pest. (See The F. M. S. Government *Gazette* No. 3679, p. 1996, Vol. V, No. 59 of Dec. 19, 1913.) The object of this notification is to enable the Inspecting Staff to ascertain the distribution of these pests and to see that adequate measures are taken to control them where they occur and, if possible, to prevent their spread to districts at present free from them. Planters reporting either pest would assist the Department of Agriculture if they would at the same time report any small holdings in the neighbourhood of their estates upon which these pests are to be found.

The remaining five sections of the Enactment deal with miscellaneous details. Section 22 provides for the manner of service of notices under the Enactment. Section 23 provides that the penalty for the improper use of any material supplied by the Government for the prevention or eradication of a pest shall be a fine not exceeding $250. Section 24 provides that the penalty for any breach of the provisions of the Enactment for which no definite penalty is stated shall be a fine not exceeding $200. Section 25 has been dealt with. Section 26 states the conditions under which actions may be brought against any person for anything done in the exercise or supposed exercise of the powers conferred by this Enactment.

NOTE ON A LATEX HYDROMETER

By B. J. Eaton.

A number of enquiries has been received from planters, firms and from scientific apparatus makers in England on behalf of clients with reference to hydrometers for ascertaining the rubber content of latex, since the publication of the section dealing with the density of latex in Bulletin No. 17 issued by the Department of Agriculture, F. M. S.

Although the writer has not been able to complete the investigation of this problem, a very delicate hydrometer has been constructed by Messrs. J. J. Griffin & Sons from detailed instructions given by the writer, which should prove of value for several purposes in rubber estate factories, laboratories etc.

Density of Hevea Latex.

The principal difficulty which arises in the use of an hydrometer for testing the density of latex and thus arriving at the rubber content, is the fact that the variation in density between an average latex containing about 30 per cent of rubber and the density of pure water is only about 0.02. An average pure latex has a density of about 0.9800 compared with water with a density of 1.0000. In order therefore to make the instrument more delicate it was essential to have the graduations between 0.9800 and 1.0000 extending over a fairly long stem, otherwise differences cannot be read very accurately.

Another important point which has to be remembered is that latex is readily "fermented" by microorganisms of putrefaction, which gain entrance from the air, acting on the protein constituents and producing acidity which gives rise to the formation of bubbles of gas and causes partial clotting or coalescence of the caoutchouc globules. On this account the density of a latex which has been standing for some time is likely to differ from that of freshly collected latex, and secondly the small coalesced particles of rubber prevent the accurate working of the hydrometer.

Description of Hydrometer.

Experiments were carried out with several types of hydrometer and the most suitable instrument was found to be a brass hydrometer with cylindrical bulb and rectangular stem, the latter being graduated on both sides.

Glass hydrometers are to be preferred in many respects as they are easy to clean and do not tarnish or corrode as metal instruments are liable to do, especially in the tropics. Unfortunately however these instruments are so delicate in structure that they are easily broken in transport from Europe and in the factory, and are not recommended solely on that account. In order to avoid calculation and so that instruments may be comparative, it is recommended that the instrument be graduated at 84° F (instead of 60° F as in Europe) this being the average shade temperature during the

day in a factory or laboratory in this country. It was also found impossible to test the density of pure strong latex containing about 35 per cent of rubber directly, by means of the instrument, owing to the viscosity of such a latex. It is therefore recommended that in such cases, the latex be diluted with an equal volume of water and the density of the diluted latex taken. The rubber content of this diluted latex found from its density, will then be half the rubber content of the pure latex.

Uses of the Hydrometer.

The writer has found this instrument of considerable value for experimental tapping and other data; instead of having to weigh the rubber from each experimental plot and keep it separate from other plots, by measuring the volume of latex and observing its density, the rubber content can be obtained either from a table made previously for latex of known rubber content and density or preferably from a curve shewing the relationship between density and rubber content of latex and the latex bulked subsequently with that from other plots, in order to obtain a more uniform rubber for market purposes.

Secondly the instrument enables one to ascertain whether water is being added to any extent to latex in the field and to control the dilution in the factory, so that, except on a wet day the latex may be diluted with water to such an extent that its density, and hence its rubber content is always the same. In this way, very uniform results can be obtained in the preparation of smoked sheet. A satisfactory density figure at which to work is approximately 0·9898 indicating a latex containing 15 per cent or 1.5 lbs. of rubber per gallon. An instrument of the type mentioned above can be purchased from Messrs. J. J. Griffin & Sons, Scientific Apparatus Makers, Kemble Street, Kingsway, London, W.C. This firm has for some considerable time listed other hydrometers graduated for the tropics, although other firms will no doubt be able to supply similar instruments.

The dimensions of the above instrument are as follows:—

Total length of stem	8 inches.
Length of stem between graduations 0.980 and 1.000	7 „
Length of cylindrical bulb	3¼ „
Diameter „ „	1⅝ „
Total length	13 „
Price	£1 2*s*. 6*d*. = $9.65

REPORT ON THE WORK OF LOCUST DESTRUCTION JANUARY 1- MARCH 15, 1914

By F. W. South.

Selangor.

At the beginning of January the State was divided into two halves and each half placed in charge of a Special Assistant with 4 conductors and a few coolies whose duty it was to keep the flying swarms under observation. The northern half extended as far south as Kuang and the southern half from Kuang to the boundary of the Negri Sembilan. Flying swarms were known at Kerling and around Ulu Yam and Kalong with others around Sungei Besi and Kajang. One small swarm was reported near Bentong in Pahang, but it and that at Kerling died out, apparently without laying any eggs. All these swarms were kept under careful observation, so that the breeding grounds might be known immediately the locusts commenced to lay their eggs. During the second half of the month large numbers of flying locusts were caught by the Malays in the Ulu Yam and Kalong neighbourhoods, the method being to shake them off bushes and trees when they were resting at night and to collect them on sacking spread on the ground below. In this way a very considerable quantity of gravid females were destroyed. The catching was discontinued on January 30th as all the insects were then known to have laid their eggs. The first batches of eggs were found in four different places at Kalong on January 22 and others were discovered in the same neighbourhood five days later.

On February 1st hoppers appeared at Kalong and on February 10th others appeared on the Sungei Besi Road. Subsequently swarms appeared at Ulu Yam, Ulu Kalong and Sungei Choh, and others in the Petaling district near Salak South, round Sungei Besi and on the Sungei Besi—Cheras Cross Road. In the northern half of the State destruction work started at Sungei Choh on February 13th, and in the southern half in the Petaling district and on the Sungei Besi Road on February 23rd. The catch during February was as follows:

Ulu Yam Bahru, Sungei Choh and Kalong ..	1229 tins	
Petaling and Sungei Besi	282 tins	11 swarms approximately

In the first fortnight of March work continued in the same centres and was completed in the northern half of the State by March 12th. During this period an additional 841 tins were destroyed in this half of the State and almost all the locusts were

caught. It was estimated that in all about 16 large swarms were dealt with though they were somewhat broken up. Of these not more than 10,000 individuals were believed to have escaped and they were so scattered that they would fall an easy prey to insect eating birds. In all 2070 tins of insects were destroyed in Northern Selangor and, unless some swarms escaped observation far in the jungle the danger of the locusts spreading into Perak should now be reduced to a minimum. It is unlikely that more than one or two swarms at the most escaped detection as the Malays searched very thoroughly in this district.

In the same period in Southern Selangor 962 tins representing approximately 42 swarms were destroyed around Sungei Besi and in the Petaling district. Unfortunately the swarms in the neighbourhood of Salak South escaped detection until they were rather advanced in age and about 5 small swarms escaped entirely as fliers. These have since amalgamated into one large swarm. On March 5th hoppers hatched out in the neighbourhood of Kajang and others appeared about the same time near Serdang.

The total catch in Selangor from February 13th to March 15th was 3314 tins representing about 65 swarms. The number of swarms is uncertain as a swarm arising from a single breeding ground often breaks up into several parts. The destruction work in Southern Selangor is still in full progress.

It may be recorded that attempts were made to destroy hoppers with poisons in the Northern half of the State, but though repeated on 5 separate occasions these attempts were unsuccessful, 25% of a swarm being the largest portion killed on any occasion. In view of the success obtained by the Government Entomologist in his original experiments, these trials cannot be regarded as conclusive and it is expected that others will be made in the Negri Sembilan.

The Negri Sembilan.

At the beginning of the month of January this State was divided up into three districts, Jelebu and Seremban comprising one, Kuala Pilah and Tampin the second and the Coast the third. In the Seremban and Jelebu districts there were no hoppers during the month and scouting for flying swarms occupied the staff in that district; at the end of the month the flying swarms were mainly confined to an area south of Seremban between the Tampin and Port Dickson roads, none were known north of Seremban at the end of the month.

In the Coast district a certain number of small swarms appeared throughout the month and were destroyed, but the destruction work carried out was less than has been necessary in any

previous month. The swarms dealt with were almost entirely confined to the neighbourhood of Tampin Linggi. The total catch for the month in this district amounted to 59 tins comprising 39 swarms. Flying swarms were scattered over the whole district, but at the end of the month the majority were in the Linggi neighbourhood.

In the Tampin and Kuala Pilah districts there were no hoppers until January 9th when on the Malacca boundary numerous small swarms entered the Negri Sembilan from a big breeding ground in the Territory near the 29th mile on the Seremban Tampin Road. This invasion continued until January 28th when all the hoppers turned into fliers. During this time 117½ tins were taken from 24 separate detachments of this one big swarm while further very large numbers of locusts are believed to have been destroyed by burning the lalang. The total catch in the district was 118½ tins from 25 swarms of which 24 were detachments from the same breeding ground. Flying swarms were recorded in the Tampin district but appeared to be flying southward towards Malacca.

The total catch in the Negri Sembilan for the month of January was 177½ tins representing 64 swarms.

During the month of February fliers only were recorded in the Seremban district, there being 8 swarms in all; of these two large swarms are believed to have come from the big breeding ground inside the Malacca boundary to which reference was made above, or if not from there from other parts of Malacca. These swarms were all confined to the country south west of Seremban.

In the Coast district the fliers were scattered in small swarms but were most numerous at the Southern end in the Linggi and Sua Betong neighbourhoods. Seven swarms of hoppers amounting to 13 tins were all that were found in this district during the month and of these 6 swarms containing 11 tins were in one place. This constituted the total catch in the State as no hoppers were found in the Tampin district.

In the first half of the month four flying swarms only were recorded in the Tampin and Kuala Pilah districts, one of which left the district. At the end of the month only one large swarm was found near Bahau railway Station.

During the first half of March only five swarms of fliers were found in the Seremban district and these were confined to the same neighbourhood as in the previous month. These swarms are expected to lay eggs in the course of one or two weeks.

In the Coast district hoppers reappeared again in some numbers in three places, Sua Betong, St. Leonards Estate and Tampin Linggi. The swarms of hoppers on St. Leonards were reported to

have been cleared up. The total catch for the fortnight amounted to 102 tins comprising 42 swarms. The flying swarms were scattered over the whole district, and numerous swarms of hoppers were hatching out at Sua Betong which it was hoped could be dealt with effectively by means of poison.

In the Kuala Pilah district one swarm of flying locusts was found, and two others were found in the Tampin district in the east corner. Two swarms of fliers were seen in Kemuning and Keru on the Malacca boundary and two breeding grounds were found just inside the Territory. Two flying swarms were also found in this neighbourhood inside the Negri Sembilan boundary.

The total catch for the period in the Negri Sembilan amounted to 292½ tins comprising 113 swarms. During the month of February hardly any swarms of hoppers were found, and judging by this the numbers of locusts in the Coast district must be diminishing. The records of flying swarms in the other districts show that these are not very numerous, and there appear to be reasonable grounds for anticipating that after the lapse of six months both the Negri Sembilan and Selangor should be fairly free from locusts and that any swarms remaining will be small, much scattered and probably confined to remote parts of the States.

OPENING UP YOUNG RUBBER.

Basal V and Single Quarter System of Tapping.

By F. G. Spring.

An account of this experiment was published in the *Agricultural Bulletin,* F. M. S., Vol. I, page 440, and the results for the first six months then given. The object of the experiment is to compare the Basal V system of tapping with that of the single Quarter (Half-herring bone), and to find out the relative amount of rubber obtained from a varying number of cuts on the Single Quarter System.

The distance of planting is 12½ × 25 feet. The number of trees in each plot is 100, and the average girth, as shown in the tables, is practically the same. As pointed out in the previous article, the slope, drainage, and nature of the soil is similar in each case. The trees were not tapped previous to the commencement of the experiment.

The following is the result of total rubber obtained for the first six months. For monthly yields, see *Agricultural Bulletin,* Vol. I, page 440.

No. of plot.	Total Rubber. lbs.	ozs.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.	Average girth 3 feet from ground.
1	68	3½	54	5½	9	15	3	15	22.59 ins.
2	94	14½	74	5½	13	9½	6	15½	21.75 ,,
3	66	9½	47	5	12	12	6	8½	21.29 ,,
4	115	14	101	3	9	15½	4	11½	22.28 ,,

Below is a list of the plots, and the results obtained for an additional five months. Unfortunately the yields of rubber are not available for the 12th month on account of new machinery being installed at that time.

PLOT 1.

System of Tapping—Quarter (Half Herring-bone).

One cut 18 inches from the ground. Twenty cuts to the inch.

Every Day Tapping.

Average girth measured 3 feet from the ground at the commencement of the experiment 22·59 inches.

Results for 7th, 8th, 9th, 10th and 11th Months.

Time of tapping.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.	No. of trees.
15th April to 14th May, 1913.	8	13½	2	0			
15th May to 14th June ,,	15	11½	1	9			
15th June to 14th July ,,	14	4½	1	4			
15th July to 14th Aug. ,,	14	3½	1	11½			
15th Aug. to 14th Sept. ,,	18	3½	1	10			
Total ...	71	4½	8	2½	4	6	100

PLOT 2.

SYSTEM OF TAPPING—QUARTER (HALF HERRING-BONE).

Two cuts 18 inches apart. Twenty cuts to the inch.

Every Day Tapping.

Average girth measured 3 feet from the ground at the commencement of the experiment 21·75 inches.

RESULTS FOR 7TH, 8TH, 9TH, 10TH AND 11TH MONTHS.

Time of tapping.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.	No. of trees.
15th April to 14th May, 1913.	10	4½	2	7			
15th May to 14th June „	19	13½	2	10			
15th June to 14th July „	21	2	2	4			
15th July to 14th Aug. „	29	3	2	13			
15th Aug. to 14th Sept. „	21	9	3	4			
Total ...	102	0	13	6	10	6	100

PLOT 3.

SYSTEM OF TAPPING—QUARTER (HALF HERRING-BONE).

Three cuts 18 inches apart. Twenty cuts to the inch.

Average girth measured 3 feet from the ground at the commencement of the experiment 21·29 inches. Every day tapping.

RESULTS FOR 7TH, 8TH, 9TH, 10TH AND 11TH MONTHS.

Time of tapping.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.	No. of trees.
15th April to 14th May, 1913.	11	8	2	10			
15th May to 14th June „	14	10	2	8½			
15th June to 14th July „	21	0	1	4			
15th July to 14th Aug. „	22	9	2	9½			
15th Aug. to 14th Sept. „	22	10	2	4			
Total. ...	92	5	11	4	10	1	100

PLOT 4.

System of Tapping—Basal V.

One cut 18 inches from the ground. Twenty cuts to the inch.

Every Day Tapping.

Average girth measured 3 feet from the ground at the commencement of the experiment 22·28 inches.

Results for 7th, 8th, 9th, 10th and 11th Months.

Time of tapping.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.	No. of trees.
15th April to 14th May, 1913.	24	3½	1	11			
15th May to 14th June ,,	27	11	1	7			
15th June to 14th July ,,	32	14	1	3			
15th July to 14th Aug. ,,	47	0	1	2			
15th Aug. to 14th Sept. ,,	39	12	2	2½			
Total ...	171	8½	7	9½	9	1	100

Total Yields for Eleven Months.

No. of plot.	Total Rubber. lbs.	ozs.	Latex Rubber. lbs.	ozs.	Scrap Rubber. lbs.	ozs.	Bark Shavings. lbs.	ozs.
1	152	0½	125	10	18	1½	8	5
2	220	10½	176	5½	26	15½	17	5½
3	180	3½	139	10	24	0	16	9½
4	304	1	272	11½	17	9	13	12½

During the first six months tapping, as pointed out in the previous article dealing with this expeirment, a comparison of plots 1, 2, and 3, where the single quarter system is conducted,

reference to the tables will show that in plot 1, where there is only one cut, the amount of total rubber is 68 lbs. 3½ ozs., in plot 2, with two cuts, the amount of total rubber 94 lbs. 14½ ozs., while in plot 3, which has three cuts, the amount of total rubber is 66 lbs. 9½ ozs., and the basal V yields 115 lbs. 14 ozs.

The results from the 6th to the 12th month show somewhat similar differences, the one cut to a tree yielding less in proportion to two cuts than that for the first period, with three cuts there is a slight proportionate increase, but the two cuts continue to yield larger amounts of total rubber than one or three.

Over the period of eleven months, reference to the tables show that one cut (Single Quarter System) yields 152 lbs. ½ oz. total rubber, two cuts yield 220 lbs. 10½ ozs. total rubber, three cuts 180 lbs. 3½ ozs. total rubber while the Basal V yields 304 lbs. 1 oz. total rubber. It should be remembered that in each plot tapping is conducted every day. Judging from the above figures it is fairly clear that it is not advisable, on young trees, to have more than two cuts on the Single Quarter System, and it is very doubtful if this number can be increased even on old rubber. On the supposition that old trees have a greater reserve, and feeding capacity it would be expected that they could carry a larger number of cuts, but it must be remembered that as the girth of the tree increases, the length of the cuts are correspondingly greater.

It is noticeable in this experiment that one cut, over a period of the first eleven months' tapping, yields approximately as much total rubber as three cuts. The Basal V, far exceeds that of two cuts on the Single Quarter System, and this difference is likely to be maintained the second year, with a similar V on the opposite side of the tree. During the 3rd and 4th year, in the case of the V, it will be necesary to resort to a top V when there is a possibility of a reduction when compared with the same time of tapping on Single Quarters, but over the period of the four years it seems probable that the difference will be in favour of the V. Commencing with a top V 36 inches from the ground (see *Agricultural Bulletin*, F. M. S., Vol. 1, No. 9), and tapped for two years, or, until half the circumference of bark is removed a much larger amount of rubber is obtained than from 2 years' tapping on the Single Quarter System with two cuts.

The writer favours the Basal V if it is intended to continue on this system in which case it might be preferable to place the V say 24 inches from the latex spout, and afterwards a similar V on the opposite side of the tree, this would allow of a shorter period for working on the top Vs.

Some planters have an objection to the V on account of its spoiling the shape of the tree in the course of a few years. This may be so, but personally I have never noted this peculiarity, and if, as they say, it should have a tendency to flatten out the tree, there is no objection to this as regards difficulties of tapping, the only objection would be if it reduced the yield. The writer's experience is that the V has given a gradual increase as tapping progressed and has shown no sign of a reduction.

DEPARTMENT NOTE.

Mr. J. R. Hill, 2nd Assistant Agricultural Chemist, Department of Agriculture, Federated Malay States, Kuala Lumpur, has resigned his appointment on 18th March, 1914.

Mr. G. E. Coombs, Economic Botanist, Department of Agriculture, F. M. S. Kuala Lumpur, arrived and assumed his duties on 23rd April 1914.

Mr. H. W. Jack has been appointed Assistant Agricultural Inspector in place of Mr. P. B. Richards, who has been appointed 2nd Assistant Entomologist.

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected Thereon, during the Years 1914 and 1913.

Destination.	Exported during February, 1914.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1914.	Duty collected, 1914, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	$	$ c.
Straits Settlements ...	1,271.55	1,289.78	2,561.33	1,537.80	1,023.53	...	4,356,284	108,376.90
United Kingdom ...	907.57	1,071.60	1,979.17	1,962.36	16.81	...	3,462,977	86,574.45
Continent of Europe ...	121.60	119.46	241.06	255.08	...	14.02	431,140	10,778.50
Ceylon	62.94	61.61	124.55	132.89	...	8.34	220,330	5,508.12
Other Countries ...	...	...	...	...	...	...	...	...
Total ...	2,363.66	2,542.45	4,906.11	3,888.13	1,040.34	22.36	8,470,731	211,237.97

KUALA LUMPUR,
6th March, 1914.

H. W. FIRMSTONE,
Acting Commissioner, Trade and Customs, F.M.S.

Abstract of Meteorological Readings in the various Districts of Malaya for the Month of February, 1914.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	149.	79.5	87.07	71.46	15.61	75.2	.790	72.2	.78%	...	7.67	5.53
Malacca, Durian Daun Hos.	29.906	158.	83.5	90.3	71.8	18.5	76.1	.919	...	.81	N.	.74	.39
N. Sembilan, Dist. Hospital Seremban	...	149.3	77.4	90.9	71.1	19.8	75.2	.789	72.0	.77	N.W.	1.87	1.13
,, Dist. Hos. K. Pilah	...	156.2	80.	...	...	...	76.8	.849	74.3	.82	...	3.89	2.12
,, ,, Tampin	...	163.3	82.	...	...	...	75.6	.771	71.3	.71	...	3.39	1.40
,, ,, P. Dickson	...	163.	82.3	88.7	74.	14.7	77.2	.837	73.8	.76	...	1.96	1.17
Pahang, ,, K. Lipis	...	...	81.	88.8	70.8	18.	75.3	...	...	...	...	6.22	2.65
Penang, ,, Penang	29.847	150.9	83.7	91.9	74.4	17.5	76.9	.838	72.3	.73	...	4.75	4.25
Perak, ,, Taiping	...	108.	82.35	94.	71.	23.	77.43	.876	...	.81	...	13.00	2.83
,, ,, Ipoh	...	...	82.49	93.	69.	24.	76.97	.852	...	.77	...	...	2.66
,, ,, T. Anson	...	...	82.08	93.	69.	24.	78.37	.920	...	.85	...	11.50	1.98
,, ,, P. Buntar	...	...	82.37	93.	72.	21.	78.09	.904	...	.83	...	10.58	.44
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	.91	2.85
Selangor, General Hospital Kuala Lumpur	...	120.5	80.5	90.3	69.2	21.1	76.9	.860	74.6	.82	...	9.39 7.40	1.73
,, Dist. Hos. Klang	...	...	80.9	90.4	72.0	18.4	76.1	...	...	...	...	6.27	2.93
,, ,, K. Selangor	...	...	...	91.3	72.8	18.5	...	...	...	...	...	2.26	1.18
,, ,, Rawang	...	...	...	91.7	71.2	20.5	...	...	...	...	...	8.38	3.77
Singapore, Kandang Kerbau Observatory	29.952	166.	82.9	92.8	68.	24.8	76.9	.844	...	.76	N. E.	3.04	1.11